sensory stimulation kit

a teacher's guidebook

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SENSORY STIMULATION KIT: A TEACHER'S GUIDEBOOK

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CAUTION—
SEE ACTIVITY CARD

These caution labels appear on several kit items. Please refer to the appropriate activity card and read the caution before using the kit item.

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Mrs. Ginger Alexander, Upsal Day School for Blind Children, Philadelphia, Pennsylvania

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Mrs. Sherry Raynor, Ingham Intermediate School District, Lansing, Michigan

Ms. Toni Skinner, California School for the Blind, Berkeley, California

The Sensory materials were field tested in eleven educational programs for multihandicapped, visually impaired and preschool visually impaired children. The schools listed below have been extremely helpful in field testing the materials and completing evaluations on the Sensory program:

Dallas Services for Visually Impaired Children, Dallas, Texas

Developmental Disabilities Center of the Louisiana State University Medical Center, New Orleans, Louisiana

East San Gabriel Valley School, West Covina, California

Glenrose Provincial Teaching Hospital, Edmunton, Alberta, Canada

Infant Program for Visually Impaired Children, Mason, Michigan

Oregon State School for the Blind, Salem, Oregon

Outland School for the Multihandicapped, Saratoga, California

Perkins School for the Blind, Watertown, Massachusetts

South East Metropolitan Board of Cooperative Educational Services, Denver, Colorado

Upsal Day School for the Blind, Philadelphia, Pennsylvania

Washington State School for the Blind, Vancouver, Washington

INTRODUCTION

Basic sensory stimulation materials have been identified as a priority materials need for visually impaired children. Ten consultants, familiar with the needs of visually impaired children, met at the American Printing House for the Blind in March 1975 for the purpose of identifying material needs priorities for visually impaired children functioning at early developmental levels. A collection of sensory stimulation materials was suggested and ranked by the consultants as the most needed material for these children.

As a result the Sensory Stimulation materials have been designed to facilitate the development of basic sensory processes in very young visually impaired children and multihandicapped visually impaired children. The impaired child needs to explore his or her environment by stimulation of all available senses: visual, auditory, tactile, olfactory, and gustatory. The teacher is the catalyst for promoting the child's sensory experiences with himself and his environment. The stimulation experiences will most likely need to be introduced frequently in order to be internalized and understood. As the multihandicapped visually impaired child uses residual sense modalities to learn about himself and his surroundings, he will develop independence and confidence. The twenty-five items in the Sensory Stimulation Kit enable teachers to provide a wide range of basic sensory stimulation experiences in the five sensory modalities.

The Sensory Stimulation Kit guidebook is designed to be a resource manual for instructors using the kit materials. The guidebook contains a collection of articles and information relevant to providing stimulation experiences for developmentally young visually impaired children.

SENSORY STIMULATION KIT ITEMS

Auditory

Quantity	
8	Melody bells
6	T-shaped rattles (three paired sounds)
1	AM Transistor radio
1	Drum with two drumsticks
4	Rhythm instruments (Maraca, castanets, sound shaker, cluster bells)

Tactual-Kinesthetic

Quantity	
8	Three adult-sized texture mitts and five child-sized texture squares
1	Feather duster
5	Tactual rollers with interchangeable heads (three textured rollers and two blank rollers)
3	Assorted brushes
2	Temperature bags
6	Weighted bags (three paired weights)
4	Rubber squeeze toys
1	Air blower
1	Vibrator, four texturally distinct heads, and an irregularly cut foam pillow
1	Brush machine

Visual

Quantity	
1	Flashlight, five translucent color discs (white, yellow, blue, red, green), four transparent color discs (yellow, blue, red, green), plastic ring with which to attach discs
1	Penlight, five translucent color caps (white, yellow, blue, red, green), four transparent color caps (yellow, red, blue, green)

Visual (continued)

Quantity	
1	Eye Patch
1	Nondirectional light
4	Plexiglass color viewers (yellow, blue, red, green)
1	Mirror with stand-up base
1	"Magic window"
1	Thing-mobile

Olfactory

Quantity	
10	Scent cards (five paired scents)
5	Plastic jars for smells

Gustatory

Quantity	
6	Squeeze feeder bottles

General

Quantity	
1	Teacher's guidebook
1	Set of activity cards

GUIDELINES FOR USE OF THE SENSORY STIMULATION KIT

These guidelines are intended to provide the teacher or assistant with suggestions to maximize use of the Sensory Stimulation Materials. The following statements are generalizations; the teacher should be sensitive to the uniqueness of each child in utilizing the Sensory materials and activities.

1. Assume the child can learn. Carefully task analyze the activity into small sequential steps, appropriate to the child's level of development.
2. Be organized before beginning the activity. Have all materials within reach and be familiar with the activity sequence you are presenting. This will help avoid potential behavioral problems.
3. Position the child before beginning the activity. It is often helpful to work from behind the child, sitting on the floor. It is easier to put the child through various movements in a natural manner if you are working behind the child in a hand-over-hand fashion. For younger children, you may wish to sit on the floor and lay the child on his back, facing you, with the child's legs resting on your thighs.
4. Carefully choose and schedule the use of reinforcers for which the child will perform.
5. Attempt to reduce or eliminate environmental distractions for the child by choosing an appropriate setting for the activities. The setting should be a quiet area that is comfortable for you and the child.
6. The materials should usually be presented one item at a time. Materials not being used should be out of sight and reach of the child.
7. Be consistent in your presentation of the materials and in the manner in which you handle the child.
8. The child often reflects the attitude of the teacher towards the activity. Be enthusiastic about the lesson you are presenting.
9. When presenting the materials, use short simple words, phrases or sentences. Follow this procedure even if the child has a documented hearing loss.
10. Push the child to do as much for himself as possible.
11. Low functioning children may need to have the activities repeated often before there is a change in response. Persevere and be patient.
12. Some children are initially tactually defensive and are resistant to a specific sensory activity or to all sensory stimulation. Gradually guide the child through the activities to which he or she is resistant with your hands over the child's hands. Some children do not understand the experiences they are resisting and may eventually become tolerant of the activity.
13. Repeat successful activities. Praise the child for being successful, cooperating, listening or trying. The child senses your approval by your words, manner of touching, facial expression, and so on.
14. If a child is not responding to a sensory experience, pair that experience with a familiar, positive sensory experience. For example, if a child does not respond to vibration, but he responds favorably to light, pair the presentation of vibration and light. Turn on a light while you apply the vibration.
15. If the child does not respond to your request to perform an activity, repeat the verbal request while you assist the child in performing the action in a hand-over-hand manner.
16. Some low functioning, multi-impaired children may have difficulty completing the higher level activities in the Identification

and Exploration/Selection areas. Use your knowledge of the individual child to decide whether or not to continue attempting a particular activity.

17. Be cognizant of the child's attention span.
18. Involve parents or surrogate parents in continuing the sensory stimulation within the home. Many home activities provide a variety of sensory experiences; the parents need to be made aware of how to make good use of these everyday experiences.
19. Any caution concerning the use of a kit item is included with the activity for that particular item. Be sure to read and observe the caution before beginning the activities.
20. Record your observations of the child's progress as soon as possible after the activity has been completed.
21. Sanitize materials frequently.
22. Do not limit your use of the kit items to the suggestions on the activity cards. Use your creativity to develop additional sensory experiences which will provide each child with stimulation suitable to his needs.

MULTI-SENSORY STIMULATION

A rich environment of varying sensory stimulation experiences is crucial to the visually impaired or multihandicapped child's ability to progress through appropriate developmental stages (Carolan, 1973). The child's sensory modalities synthesize the information obtained from interaction with the environment and help the child structure a meaningful model of the external world (Barraga, 1973). The child gleans information from her/his sensory modalities about objects and their movements as well as from knowledge of her/his own abilities and body parts. By utilizing and coordinating information obtained from all functioning sensory modalities, the child recognizes, understands, and interprets stimuli and, thereby, can learn to react appropriately (Robbins, 1960).

The range and variety of experiences should be structured and controlled to minimize confusion in information processing by the child while helping to organize the sense impressions (Barraga, 1973). Guidance is needed so that the child experiences the world and learns of its significance to her/him (Robbins, 1960).

To assure that the child's perceptions are meaningful and representative, there needs to be a conscious effort by adults to guide and direct the child's experiences (Galloway, 1971). The learning task needs to be broken into small steps to accommodate the multihandicapped visually impaired child's extensive developmental gaps and limited behavioral repertoires. Initially, a child's frequent apathy and minimal environmental interaction makes the traditional teaching techniques of shaping or prompting, waiting, and immediately reinforcing a response impossible. A successful procedure called "movement building" has been developed whereby the teacher begins by physically moving the child through the response being taught (Mira & Hoffman, 1974).

Galloway (1971) indicates that the development of any particular sense progresses through five phases in order to become a means of receiving information: (1) awareness of the stimulus; (2) tolerance of the sensory stimulus; (3) recognition of the stimulus; (4) interpretation of the stimulus; and (5) appreciation of the meaning

or purpose of the stimuli. Senses can be developed by practicing attending activities and presenting stimulation aimed at isolated senses; however, this is not how the child will encounter the world. All of the senses—visual, auditory, tactual-kinesthetic, olfactory, gustatory—interrelate to assist the child in forming concepts. Whenever a child comes in contact with an object, her/his attention should be directed to all aspects of the object until the child can decide which characteristics are most significant and useful for identification. The multi-sensory approach to sensory readiness is most effective in helping the child learn how to utilize all of her/his intact senses and whatever residual abilities remain in the impaired senses (Galloway, 1971).

A multi-sensory approach is particularly useful in heightening the child's awareness of sensations and discovering information obtainable through her/his body parts (Robbins, 1960). Coordinating sensory input of an object's distinctive color, definite shape, specific texture, familiar taste, and identifiable smell can motivate the child further to attend and tolerate the stimulus. For example, if the child withdraws from one sensation—such as vibration—the presence of an accompanying and rewarding sensation—i.e. light—can help the child maintain contact, gain information, and interact with the stimulus more fully. Once the child tolerates and becomes familiar with the stimulus, enough interest may be generated for her/him to continue manipulating and exploring in her/his own way. The child can then begin the process of gathering, recognizing, and interpreting the available sensory information. Each experience needs to be repeated periodically to enable the child to remember, refine, and internalize the concept (Galloway, 1971).

For an object to be meaningful to the child, she/he needs to recognize it in whatever situation and location and through whatever sense modality she/he encounters it. The child will make continual refinements in her/his concepts as she/he progresses from gross to fine discriminations about the general and unique characteristics of the object. The object will become recognizable through primary characteristics without needing knowledge about all aspects Socially and culturally acceptable interpretations can be made when the child is mature enough to use the object.

There is material available giving specific examples and suggestions to adult care-givers and teachers about what to expect and how to encourage optimal development of the visually impaired child. Robbins (1960) believes that the most suitable and available material is found in everyday situations which supply the child with a variety of sensory experiences and contextual information about the environment. Galloway (1971) delineates some comprehensive suggestions on structuring experiences using environmental stimuli to assist a multihandicapped visually impaired child in understanding the environment and moving purposefully within it. The experiences and materials presented by Galloway (1971) are itemized on the chart in the next section of the guidebook. The more means by which the visually impaired or multihandicapped child has to increase her/his sensory information about the environment and to make appropriate interpretations, the better the potential for independent functioning.

References for multi-sensory stimulation follow.

Multi-Sensory Stimulation References

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CHART OF
SENSORY STIMULATION ACTIVITIES and MATERIALS for VISUALLY IMPAIRED MULTIHANDICAPPED CHILDREN

Note. Summarized from Galloway, A. "Sensory awareness for the preschool deaf-blind child through orientation and mobility instruction." In *A close look at . . . M-H.* Azusa, Calif.: The East San Gabriel Valley School for Multihandicapped Children, 1971.

Sensory Mode	Purpose of Activity	Suggested Activity	Materials
Tactual	To promote tolerance of a tactual-thermal stimulus	Frequently expose child's whole body to a wide variety of tactual experiences. Such experiences should be repeated until the child will allow contact with the stimulus for a period of time sufficient for exploration. At first be consistent with the texture. Be aware of potential thermal changes of objects. Some experiences may need to be initiated first through partial body exposure (a hand or foot), gradually increasing contact until whole body exposure to the stimulus is achieved. While working with the child, always use language appropriate to the child and to the situation.	**Grass:** dicondra, bermuda, tall weeds **Rugs:** shag, cropped, hi-low tactual patterns **Cement:** smooth and rough, cool, warm, and hot **Sand:** at a standup table, small box, big sandbox, wet, dry, damp, cool, warm, hot **Water:** pool, bathtub, basin, bucket, cup, cold, cool, warm, hot **Clothing:** warm or cold, wet or dry, cotton, nylon, wool, corduroy, satin, silk **Blankets and Mats:** slick, with buttons or folds, hot or cold, wet, dry **Food:** smooth, sticky, bumpy, thin, thick, cold, warm, hot **Bushes, Trees, and Flowers:** size, shape, texture, growing and cut Soap and Towels Paper and Cloth Walls and Windows **Doors and Floors:** smooth, rough, slick **Animals:** cats, dogs, fish, ponies, large and small **Boxes of Materials:** packing and cloth materials All kinds of toys

Sensory Mode	Purpose of Activity	Suggested Activity	Materials
Tactual	To have child become aware of his contact with the tactual stimulus	(1) Have child roll, rock, sit, lie, crawl, walk, or play on rugs, mats, floors, grass, cement.	Rugs, mats, floors, grass, cement
		(2) Have child sit, lie, crawl, jump, scoop, pour, or dig in sandbox.	Sandbox
		(3) Have child walk, jump, splash, kick, float, or dunk in water.	Water
		(4) Roll child in blanket, roll child on blanket, cover child up.	Blanket
		(5) Put clothes on child and take them off.	Clothes
		(6) Wrap material around child's body, wave it across the body.	Material swatches
		(7) Allow child to play in his food with fingers, put his food in his mouth, touch his food to his lips, tongue, and face.	Food
		(8) Have child touch, brush against, or hold parts of trees, bushes, or flowers.	Trees, bushes, flowers
		(9) Wash and dry hands at bathroom sink; wash child's body in the tub; dry body after swimming.	Soap and towels
		(10) Have child trail, tap, or rub walls and windows.	Walls and windows
Tactual	To increase tactual awareness by using a multi-sensory approach	Cover a vibrator with a texture. Take child into dark room and place the vibrator in the room with a light focused on it. The light will draw the child's attention. The vibration will reward the child's contact with the texture and help maintain the attention and the contact long enough for him to begin exploration.	Vibrator covered with a texture, dark room, a light source
Tactual	To develop tactual recognition of stimulus	(1) Allow child to have repeated contacts with stimulus. Move the object and the child to allow maximum contact. If the object is movable, it should appear in a variety of appropriate situations and locations. If it has more than one form it should appear in several forms.	**Rugs:** bathroom, classroom, shag, cropped, large, small, wall to wall **Flowers:** growing and cut **Water:** cup, faucet, pool, bath, sink, to drink, to wash in, to play in

Sensory Mode	Purpose of Activity	Suggested Activity	Materials
		(2) Put child through appropriate motions of the stimulus each time he has contact with it: (a) Sit child in wagon and pull it. (b) Help child drink water, splash in it, and wash in it.	 Wagon Water, cup, soap, towel
Tactual	To develop tactual interpretation of stimuli	If the child brings a tactual object to an adult or takes an adult to it, the accepted purpose should be demonstrated while putting the child through the motions.	Drinking fountain, soap, towel, clothes, food, pool, sink, cup
Proprioceptive and Kinesthetic	To develop awareness of body parts and what they can do	Pat the child's body parts saying (or signaling) what it is, move that body part in various positions on the mat and through space. Later the child can independently move a designated body part through visual, tactual, or auditory command. This method can also be used while the child is standing before a full length mirror.	Mat, mirror (full length)
Proprioceptive and Kinesthetic	To develop an awareness of his relation to space	Move child's body or have child move his body through space, e.g., bending, twisting, walking, jumping, swinging, swimming, climbing, and sliding.	Gym equipment
Visual	To recognize some object through the visual sense	Presentation of the object should be done in a good light for the child, usually with the child's back to the light. The range and angle for the best use of the vision can be obtained by observing the child holding an object for inspection or, in a dark room, the manner in which he focuses on the light of a candle. If the range or angle is limited or unusual, it should be used as the focal point from which objects can be moved to other heights and distances for possible expansion of the visual range.	An object; light source—lamp, sunlight, or candle
Visual	To help the child become aware of the presence and absence of light	Seat the child in a dark room. Turn on a light source aimed at the child's face. The source is held at a reasonable distance from the child. Leave the light source on as long as the child attends up to 15 seconds, then turn off the light. Wait several seconds then repeat.	Dark room, light source with on/off switch

Sensory Mode	Purpose of Activity	Suggested Activity	Materials
Visual	To help the child become aware of the direction from which the light comes	While the child is sitting in the dark room the light source is first aimed toward the side of the child's head with the source even with his shoulder, then move it behind him just off his midline to first one side then the other. Finally move the light source above the child's head, slightly in front of the midline of the head then down towards his waist.	Dark room, light source
Visual	To help the child become aware of the light source itself	Direct the child's body, head, eyes toward the source, extend his arm to touch the source. Then, with the child's hands down, move the light source to the left, right, up and down in front of the child's head within his visual field, attempting to maintain visual contact. Later, when walking down a hall, an open door to the outside, or to a sunny room will allow channeled sunlight as a light source. Turn the child's head if he does not notice it.	Light source, hallway, door, sunlight
Visual	To help the child recognize the light source	Move the light just out of the reach of the child, then slowly bring the light back. Wait. Guide the child to move toward the light and assist him to reach out and touch the source in a safe manner. (This is an opportune time to teach "hot".) Use appropriate language to describe the location and direction of the source. Repeat the procedure many times, using a variety of light sources.	**Light sources:** candles, lamps, black lights, tensor lamps, flashlights, matches, lighters, Christmas Tree lights, strobe lights, and toys which have lights
Visual	To have child learn to move (with a minimum of assistance from an adult) to a light source	Have child sit in a dark room with nothing in his hands. Turn on a light. If the child does not move toward it, move the light toward him until he has located the direction, then replace it in its original location. Intervene in his movements only if he does not attempt to manipulate the light by either moving it, turning it on or off, or if he is inappropriately manipulating it in a dangerous manner.	Dark room, light source
Visual	To help the child hold an object up to the light for inspection	Darken the room. Put object in child's hands. Turn on a light (e.g., a small lamp). Encourage child to move toward the light to visually inspect object. Intervene only if he drops the object and cannot (or	Small object; small lamp

Sensory Mode	Purpose of Activity	Suggested Activity	Materials
		does not) relocate it, or if he gets to the light source, but looks at it rather than putting the object in the light's path for inspection.	
Visual	To use sunlight to assist vision	Put something in child's hand and move toward a door or window carrying object. Hold object up into the path of light without looking directly at the sun. Observe child to see if he inspects object.	Small object, door or window with sunlight coming in
Visual	To use sunlight to assist orientation	Help the child turn his head or eyes toward the direction of the sunlight (but not directly at it) and move toward the opening through which he can see the light.	Door or window with sunlight coming in
Visual	To develop a tolerance for focusing on visual stimuli	(1) Place a candle or soft light between the child and a visual object. Direct child's attention to object.	Dark room; candle or soft light; small visual stimuli (color cards, small colored objects, simple toys, small object with holes, clothes, bells, and very simple puzzles), larger visual stimuli (balloons, balls, wagons, mirrors, playground equipment, large scarves, stairs, musical instruments, clothes, furniture, piano)
		(2) Have child sit in a dark room with an adult sitting on the floor facing him. Light a candle between the two and hold a small bright colored object behind the tip of the candle's flame. Move the object in front of the candle, then return it behind the light. Repeat this activity and vary the object often.	Same as above
		(3) Use a tensor lamp as a light source. Place the bulb close to the floor so the child can't look directly into the light. Put object in the circle of light. Have the child sit next to the object while you move it toward the bulb and back to the floor, changing the light intensity on the object. Move the object out of the range of the light and then return it to the light.	Tensor lamp, flashlight, or black light; small object

Sensory Mode	Purpose of Activity	Suggested Activity	Materials
		(4) Use a room with a light. Have the child sit with his back or side to the light source and with an object in front of him on the table or the floor. Put his hand on the object while directing his head toward it. Go through the motions of using the object; then bring it toward his eyes for inspection. Return the object to its original position. Repeat several times. Vary the objects when the child appears to be getting bored. (With a larger object the child will need to be taken to it.)	Room with a light source, an object
		(5) When putting clothes on, hold the item of clothing at eye level and at an appropriate distance from the child's eyes. Guide the child through the motions of putting on the particular item of clothing giving as much assistance as necessary. When through, pat that part of the child's body that is now wearing the clothes and have him look at it and touch it. Do not do this unless the activity following is appropriate to the dress of the child, (e.g., put on the sweater —go outside).	Clothing
Visual	To help child become aware of visual stimuli	(1) Sitting with a child in a dark room, light a candle in full view of the child. Place an object so he sees it behind the candle's flame. Move it around the candle, and in and out of its light. Have the child hold the object and move the candle so that the flame's glow shows on it. The light can also be used to draw his attention to a particular object.	Dark room, candle, small object
		(2) Using a tensor lamp as a light source, make a circle of light on the floor and place an object in the circle. When the child takes his eyes off the object, turn the light off. Repeat about five times at one sitting. Later, with two or more tensor lamps around the	Dark room, tensor lamps, black light, flashlight, small objects

Sensory Mode	Purpose of Activity	Suggested Activity	Materials
		room, repeat as above. If a black light is used, when the child takes his eyes off the object, cover it up and turn off the light. Wait several seconds then turn the light on with the item covered, then uncover it. Using flashlight move the circle of light from one object to another, waiting each time for the child's attention. Turn the light off when he stops attending. Vary the stimuli to maintain interest and broaden the exposures.	
Visual	To help the child learn to interpret stimuli visually	If the child brings an object to an adult or takes the adult to the object, the adult should use that object appropriately and guide the child's body through the appropriate use.	Ball, mat, bathing suit, cup
Auditory	To use light and vibration together to assist tolerance of sound	Place child (wearing proper amplification) in the middle of the room with a musical instrument, a tensor lamp, and a vibrating pillow. Darken the room. Make a sound with the musical instrument and at that moment turn on vibration and light. Keep all three on for the same duration. Turn everything off; wait several seconds and repeat. Later eliminate vibration. Then show light a second later than the sound. (The light source and the sound source should have the same locations.)	Musical instrument, the tensor lamp, a vibrating pillow
Auditory	To use light and vibration together to assist awareness of sound	Set the child in a quiet room with a sound source which is visually seen. Wait for a few seconds in quiet, then make sounds, one at a time, which are both familiar and new to the child. (This can also be done in a dark room.) Wait for a few seconds in quiet and then make the sounds again. The rhythm of sounds should be tapped on the child. Beat a drum in time with the movements of the child, thus integrating his movements with sound.	Sound sources, drum
Auditory	To assist awareness of rhythm	(1) Set child on top of a piano or with his body in contact with an autoharp. Child will feel the vibration.	Piano, autoharp

Sensory Mode	Purpose of Activity	Suggested Activity	Materials
		(2) Adults should chant or sing while doing motor activities and pat the child's body rhythmically.	
		(3) During all music activities, help child clap, hit a drum or tambourine, or move his body to the rhythm of the music.	Drum, tambourine, some type of music
		(4) Help child strum an autoharp rhythmically or push the keys of an organ in a particular rhythm. While music is being played, help the child to move freely.	Autoharp, organ
Olfactory	To be aware of scents that are associated with objects which are familiar	Present a stimulus with a definite odor many times. Initially, it should be explored through another sense to insure a clear concept of the object, with only secondary emphasis on the smell. The child should look at it, then feel it, then taste it and then smell it. Later he can be given the smell of oranges and told to match it to the object which is the source.	An orange or other object with a distinct odor

A SENSORY LEARNING ENVIRONMENT

At the Iowa Braille and Sight-Saving School in Vinton, Iowa, one large room with twelve area divisions has been designed to aid in developing sensory skills. The Sensory Learning Environment stimulates skill growth through firsthand experience. The children gather information about themselves, their environment and their ability to adapt to various surroundings.

Each of the twelve areas of the Sensory Learning Environment was carefully planned by educators of the visually impaired and an architectural firm to control the level of challenge. Theoretically, the children cannot accidentally find themselves in an area which is too difficult or frightening because they must negotiate an equally difficult task to enter the area. The possibility of alarming the child by premature exposure to an area is virtually eliminated. The Sensory Learning Environment tries to reduce the "fatigue factor" or causes for boredom by presenting a progression of increasingly difficult activities with pleasurable rewards for movement, curiosity and searching.

The Sensory Learning Environment was conceived by Charles C. Woodcock, presently Director of the Perkins School for the Blind in Watertown, Massachusetts. Mr. Woodcock worked with the architectural firm of Criteria, Inc. in Minneapolis and the staff at the Iowa School to design, develop and implement the Sensory Learning Environment. Robert Staricka was the Criteria project coordinator.

Description of Areas

1. **Curiosity Area:**
   The first area, designed for the most inhibited children, is the "curiosity area." Through the use of soft fabrics, pleasant smells, soft music, bells, and other soothing experiences, the curiosity area attemps to environmentally caress the child into a sense of well being.

2. **Sound Pits (Chambers):**
   Upper area: Children search for sounds through a maze of tubes similar to vacuum cleaner hoses.

   Lower area: Sound is deadened so the child can concentrate on body sounds or the lack of sound.

3. **Grotto:**
   This area consists of a stone grotto, natural dried tree, and other natural materials with various textures and temperatures. This area is a quiet stopping spot for the child.

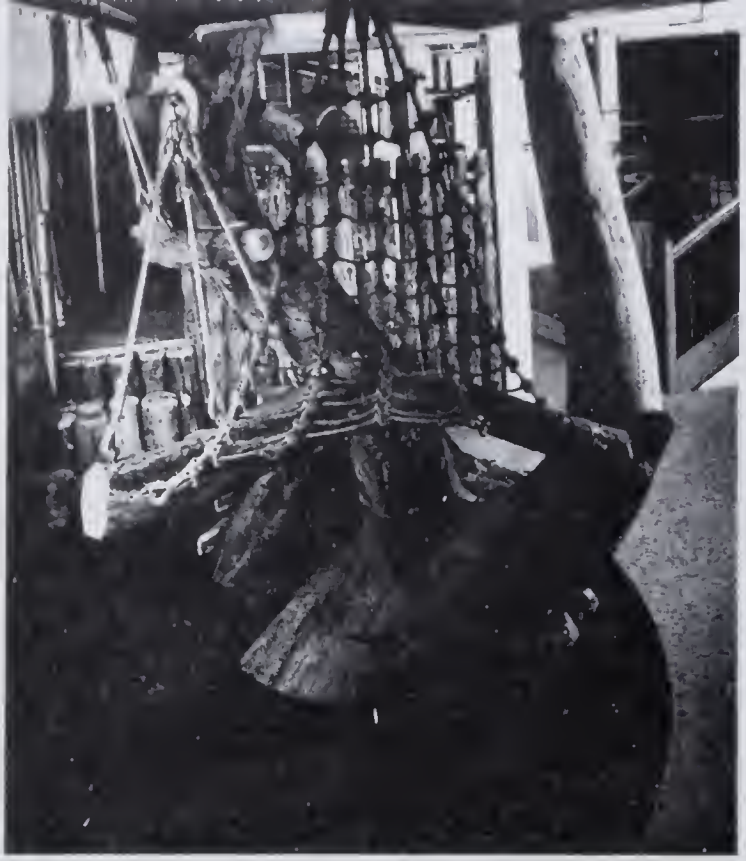
4. **Textured Walk:**
   In this area the child learns to deal with irregular "footings" and random obstacles.

5. **Tree House:**
   A private place where textures, sounds and environment can be explored.

6. **Rope Forest:**
   This area of suspended ropes presents a vertical maze for the child to investigate.

7. **Ramp:**
   Here the child is presented with an inclined crawling surface, ideal for large muscle coordination.

8. **Discovery Hill:**
   This "hill" consists of a contoured maze which contains openings in which a child may find interesting things to feel.



9. **Twister:**
   The twister is a warped walking/crawling surface ideal for building footing dexterity.

10. **Slide:**
    This is a short run slide and ends with the child's first free-fall experience.

11. **Foam Pit:**
    This area is designed to aid large muscle coordination through rocking, rolling, and other gross motor movements.

12. **Mattress Mountain:**
    The most challenging task area is the mattress mountain. The child needs to develop confidence to free fall when he or she is unable to see.

TEXTURE MAT

A texture mat was included in the field testing of the prototype Sensory Stimulation Kit materials. Despite the mat's popularity, it would be difficult to include a mat of good quality in the final kit. However, because the texture mat has value and can be easily assembled, directions for its construction and usage follow.

Construction

A texture mat, which provides a child with the experience of feeling various textures, can be made for classroom or home use. There are several methods. A variety of fabric textures cut into different shapes can be attached to a white fitted bed sheet. The fitted bed sheet can be pulled over

a mattress, pillow, gym mat, or sleeping bag. Other solid colored backgrounds of cloth can be used. The fabric pieces are cut into circle, square, triangle, and other geometric or irregular shapes. At least eight 12 × 12 inch square fabric shapes can fit on a single-size bed sheet, but more or less can be used depending on how much of the background is not covered. These fabric shapes can be attached to the background by sewing around each shape or using iron-on seam tape.

Fabrics chosen for the texture mat should be able to withstand many washings. For example, fabrics less susceptible to raveling are desirable. Further, iron-on seam tape loosens after considerable use and washing. The purpose of the mat must be considered in choosing the method of construction. If the children using the texture mat could benefit from a rearrangement of the fabric pieces, iron-on or regular masking tape could be used and then stripped off the background and reapplied with additional tape at another time in a different arrangement. If a single arrangement is satisfactory, the additional time involved in stitching each fabric shape onto the background would be worthwhile.

Another means of making a texture mat is to cut out fabric pieces in square and rectangle shapes. Shoestrings or thin strips of material or cord can then be attached to all four corners of each fabric shape. The shapes can then be tied to each other to form a texture mat. The fabric shapes on this type of texture mat can be easily rearranged to vary the experience of the child as she/he touches the mat with various body parts. If pieces of fabric are sewed or glued back-to-back, the mat would be reversible. However, if glue is used, the mat would not be washable.

If it is not necessary to wash the texture mat, more varied materials can be attached to the background. For example, sponges, foam rubber, vinyl, plant and tree leaves, grass mats, and so on, could be adhered with contact cement, double-backed tape or a staple gun for a temporary use.

It is important to remember in choosing fabrics that their textures may be visually deceiving. A fabric which appears to provide a distinct tactile sensation may not be distinguishable from any other soft fabric when rubbed along the skin. In choosing a variety of textures, it is helpful to rub a piece of the fabric along your arm, leg, or face to get the actual sensation. Such fabrics as terry cloth, denim, dotted swiss, corduroy, flannel, quilted cotton, brocade, and some upholstery fabrics appear quite varied but provide very few distinctions or variations in texture. The same material can be repeated on the texture mat, especially when varied in color and design for visual effects (prints, stripes); however, it is worthwhile to seek out fabrics providing distinctly different sensory stimulation experiences, such as burlap and velveteen.

Uses

A texture mat affords a child exposure to a variety of textures on different parts of the body. The child can sit, lie, crawl, walk, or jump on the mat, thereby, experiencing different textures on many body parts. Fabrics and textures can

be experienced on the hands, feet, arms, legs, cheeks, chest, and so on. Additional stuffing of cloths, stuffed animals, or pillows can be placed under particular fabric shapes on the mat to elevate that piece of material and create an irregular surface for the child to explore while crawling or touching the texture mat.

Some children may wish to play games on the mat by tossing a ball, block, or bean bag onto particular fabric shapes and jumping or stepping from one fabric shape to another. A variation of the "Twister" game could be played by children placing their feet on separate fabric shapes while bending and putting their hands on different ones. Music would be an enjoyable accompaniment to the children's body movements. Exercises can be done on the mat, such as having the child lie on the mat and stretching her/his toes and/or fingers to touch an indicated fabric shape.

The mat can be hung on a wall, movable blackboard, or screen so that children can walk up to it, thereby, experiencing the textures in a vertical position. This may be used as a reinforcement for some children to initiate and maintain an upright position suitable for walking. Many classroom uses for a texture mat can be created by the teacher for the particular group of children with which she/he works.

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AUDITORY SENSE DEVELOPMENT

Evidence of a newborn's sensitivity to sound is illustrated by the following reactions: changes in general motor activity, wrinkling of forehead, movement of the eyelids, tremors, changes of rhythm and rate of breathing, turning of the eyes and head to the source of sound, and inhibition of sucking responses. At one month, the infant responds to a loud noise by crying or startling and also responds to approaching sound by becoming quiet or reducing activity. By two months, the infant attends, stops or changes activity in response to a human voice, accepts loud noises as part of the environment, and repeats sounds for physical pleasure and auditory stimulation. At four months, the infant pays particular attention to tones of voices and localizes sound laterally by looking at the source. At six months of age, the baby responds differently to friendly and angry voices. A one-year-old child hears and understands simple words, listens carefully, knows and immediately turns toward the sound of her/his own name.

The soothing sound of voices and contact through cuddling are the infant's first means of establishing and maintaining contact with the environment. But what about infants who lack the visual sense to stimulate reaching out to the world? The sooner the child is taught to reach on sound cues, the more rapidly she/he will begin to develop ear-hand coordination to stimulate and guide her/his body movements (Fraiberg, 1977). The richer the stimulation of human voices, the more meaning the child is able to derive from the variations in quality. The search for additional auditory clarification leads the child to engage in vocal play with sounds she/he produces, and eventually to imitate sounds produced by other human beings. This process of imitation establishes a firm contact between the child and the world of sound. Imitation of vocal and other sounds is essential to future language development because she/he imitates, the child internalizes the feelings of pleasure necessary for repetition and clarification of her/his own sound production (Barraga, 1973). The child who is visually handicapped needs more frequent vocal stimulation and interaction first with adults, and then with other children, so that she/he can associate names with objects and learn useful words relating to the manipulation of her/his own body and objects encountered.

The factor of attention is of primary importance in the development of auditory discrimination skills. The child seeks and attends to sound stimulation as it is useful to her/him or contains information needed or wanted. If the auditory stimulation does not provide information beyond the level of pleasant sensation, the child may remain at a mechanical level of sound reception; auditory acuity would be developed without any contribution to auditory perceptual ability.

In developing auditory awareness, work should first be directed at perceiving gross motor sounds before fine sound differences can be comprehended. A drum makes a good tool for developing auditory perception, because most drum sounds are heard across all the frequencies of sound that are used for speech (Hart, 1974). Toys and activities which combine texture or shape with sound enable associations to be made between things, so that eventually recognition of specific sounds is indicative of identifiable objects or actions within the environment. "When meaning is derived from sound, the child is guided in her/his exploration, can develop purposeful freedom of movement in satisfying her/his curiosities, and can contribute to her/his store of auditory knowledge which is so necessary if [she/] he is to travel with confidence independently in her/his world" (Barraga, 1973, p. 145).

TACTUAL-KINESTHETIC SENSE DEVELOPMENT

During the early weeks of life there are two main sources of stimulation for the "skin senses" of the baby: the reflexive movements of her/his own body, and the touch and tender handling of those who care for the infant (Barraga, 1973). These experiences keep the infant aware of the world beyond her/himself.

The newborn experiences sensations from both touch and temperature. During the first few days of life, a touch on the infant's cheek evokes exploratory responses such as opening of the mouth, wrinkling of the lips, and sucking movements. By the age of six months, the infant will explore an object by moving her/his hand over it. Localized skin reactions on the forehead, ear, stomach and chest also occur at six months. By ten months, the baby explores parts of a toy, probing the holes and grooves with her/his fingers. A one-year-old child uses both hands fully, perhaps showing a preference for one, and picks up small objects with a precise pincer grasp.

Fraiberg (1977) found that the most reliable stimulus for eliciting a smile in blind infants was gross kinesthetic stimulation. This suggests the possibility of establishing an early reciprocity relationship between tactual-kinesthetic awareness within the child and the external influences which contribute to her/his development. In the blind infant, manipulation of the limbs provides information from the kinesthetic receptors about body space and awareness of the possibilities of movement within that space (Cratty, 1971).

A sequence of training in body image and kinesthetic perceptions helps the child use her/his body to understand spatiality and acquire accurate knowledge of the object world. Children perceive their bodies as vehicles for movement, and the visually handicapped child is no different in this respect. Because of the limitation in visual ability, meaningful body movement is difficult to learn. Objects can be moved in relation to body planes more easily than the body can move in relation to objects; similarly, movement of the total body is learned prior to accurate movement of individual limbs. The verbal discussion of each movement is necessary for the visually handicapped child to learn to think about what she/he is doing, and why she/he is doing it (Barraga, 1973). The gradual coordination of body movement with tactual experiences provides the perceptions vital to spatial orientation and freedom of movement.

Lacking the sense of vision to guide her/his movements and to coordinate the use of her/his hands to explore and seek out information, development of the blind child is dependent on planned stimulation to enable her/him to progress in the handling of her/his body, and to begin to note the differences among the things she/he touches and that touch her/him. Fingers and hands provide the most accurate perceptual information available to the blind child for discrimination and recognition of shape, thickness, and texture (Cratty, 1971). A variety of textures which are soft and warm to the touch are excellent for initial stimulation of the hands. Until the baby has developed voluntary grasping functions and has begun to explore with purpose, the primary concern should be to provide encounters with soft stuffed objects with little variation in contour—the emphasis being only on texture. Exposure to one or two textures at a time may arouse the desire for expansion of the touch sense.

Ayres (1974) states that many children who show a deficit in tactile perception exhibit behavior she labels as "tactile defensiveness." Ayres defines tactile defensiveness as a feeling of discomfort and a desire to escape the experience of certain types of tactile stimuli. Ayres believes that tactile defensiveness may be traced to an overactive self-protection system. Therefore, if the child rejects some textures or tactile stimuli, continue persisting gently. Tolerance of textures and temperature can be developed through frequent whole body exposure to a wide variety of experiences. Such experiences should be repeated until the child will allow contact with the

stimulus for a period of time sufficient for exploration. Contact with the environment needs to generate pleasant sensations in order to provide the brain with information to initiate perceptual development.

Relationships have been found to exist among tactual ability, mental age, and measured intelligence; but chronological age was unrelated to tactual ability, suggesting that the ability to discriminate tactually is developmental in nature and a learned skill (Hammil & Crandell, 1968). Many sizes and textures of objects of the same class or category must be manipulated and handled to facilitate discrimination and to provide knowledge about changes in spatial position and constancy of object weight. Objects need to be pressed between the hands and fingers to find how far in they can be moved. Holding an object simultaneously in both hands allows it to be felt by all fingers in rapidly changing combinations and gives a concept of perceived unity. By manipulation of easily handled objects the child learns that she/he is able to make them behave in specific ways and can exercise control over them at will.

Tactual discriminative and kinesthetic manipulative skills develop more rapidly with the use of language (word names and action verbs); words give meaning to objects and activities for the blind child in the same way that meaning is furnished for the sighted child through vision. Explaining, and at the same time guiding, tactile exploration and manipulation of objects gives the child knowledge of the way she/he can use things to organize information in order to clarify and strengthen the growth of a pattern of "tactual strategies" (Barraga, 1973).

VISUAL SENSE DEVELOPMENT

At birth, light is the only stimulus in the visual field to which a newborn will attend. In the first few months of a child's life, she/he begins to follow slow moving objects, attend to objects up to six feet away, and notice crude color differences. By six months, the infant's eye-hand coordination has started developing, e.g., she/he is becoming successful at grasping objects which are in the immediate visual field. The six-month-old infant can shift visual attention from one object to another in a field of two or more objects. The peripheral vision in a six-month-old is developing, as well as the ability to roll the eyes to the extreme right or left.

The one-year-old child has good far and near acuity, increasingly stronger binocular vision, focus, and accommodation. By 15 months, the child has an awareness that other people also possess the function of vision. She/he begins to expressively use the words "look" and "see." She/he points to an object of interest and says "See!" to invite the visual attention of another onlooker. Gesell, Ilg, and Bullis (1967) state that "this is a reciprocal interpersonal relationship which reminds us forcefully of the far-reaching social implications of vision" (p. 106). By the age of two years, most children can point to pictures in a book, inspect objects visually, imitate movements of others and visually seek missing objects or persons.

An awareness of the sequences of visual development is important to the teacher who is attempting to teach low vision children "to see." According to Barraga (1967) the visual functioning of a child is primarily developmental and can be improved by systematic training. To help a child develop her/his visual abilities to the highest level of efficiency, it is important to understand that:

1. The development of visual ability is not innate and automatic.
2. Visual ability is not determined nor can it be

estimated by visual acuity measurements alone.

3. Visual ability and functioning are not related necessarily to the kind of loss or degree of impairment.
4. Visual ability and efficiency may be learned through a sequential program of visual experiences. (Barraga, 1970, p. 5).

There is very little incidental learning through the visual sense when there is a visual loss. The child needs to be taught to discriminate among the forms, outlines, and symbols which may never before have been brought to her/his attention. Barraga (1970) suggests that the first step in learning to see is that of stimulation with visual objects and materials. When the eye is functioning normally, the child visually learns a great deal independently. When vision is impaired, the child must be led carefully step by step in her/his visual development and taught how to use the vision she/he has and to understand what she/he is able to see. Efron and DuBoff (1975) state that it is necessary for the child to be exposed to a rich stimulation-oriented environment. The earlier a child is given assistance in visual training, the easier it is for her/him to learn.

OLFACTORY SENSE DEVELOPMENT

Studies in the area of infant sensory development indicate that olfactory sensitivity in newborns is either absent or minimal. During the first few months of a child's life, the sensitivity to smell increases but differentiations remain minimal. However, by the time a child is four or five years old, she/he can discriminate accurately between various smells (Yendovitskaya, Zinchenko, & Ruzskaya, 1971).

The olfactory senses receive very differentiated information, whereas the gustatory sense is much less discriminatory (Barraga, 1973). The olfactory and gustatory systems are so closely related, the sense of smell will automatically be utilized in identifying tastes as sweet, sour, salty, or bitter. The smell often determines or influences the taste. When both systems of smell and taste are operating, the messages are mixed and the brain has difficulty interpreting the information as coming from one or the other. (Behar & Zucker, 1976).

A keen sense of smell can be an asset to the blind child. It assists the child in her/his interpretation of the environment. To develop this sense, Galloway (1971) suggests repeatedly presenting a familiar stimulus, such as an orange, that has a distinctive odor. Galloway also recommends that initially the stimulus be explored through all senses available to the child. This helps to insure a clear and correct conception of the object.

Daily activities such as cooking, cleaning, and walking outside provide numerous opportunities to capitalize on a child's natural curiosity in order to heighten her/his awareness of various distinguishable environmental odors. Pleasant odors are a means of enticing the child to move toward objects of events to which she/he cannot be drawn by vision. As the child grows older, the perception of identifiable odors is a source of spatial orientation indicating her/his position in relation to objects and providing cues in independent travel. Attention should be given to assisting the child in her/his use of the sense of smell, explaining and directing the child's movements so that olfactory cues supplement her/his knowledge of the environment.

GUSTATORY SENSE DEVELOPMENT

Some researchers believe that a newborn can distinguish the taste qualities of sweet, sour, and salty (Pratt, Nelson, & Sun, cited in Zaporozhets & Elkonin, 1971). However, Nemanova (cited in Zaporozhets & Elkonin, 1971) maintains that it is not until the latter half of the second month of life that some ability for taste differentiation emerges, and it is not until three months of age that the child is capable of distinguishing the basic taste qualities of sweet, salty, and sour.

Barraga (1970) observes that the mouth provides information to the infant regarding textural qualities, contour, and size of objects. Receptors on the tip of the tongue are especially sensitive and are useful in providing discrete discriminations of objects and even symbols (Barraga, 1973). Prior to using her/his hands to explore, the infant gains a wider variety of information through the mouth and the blind child needs many opportunities to suck and mouth foods of different consistencies and any objects she/he finds pleasing and which are safe (Barraga, 1973).

Eating should be an enjoyable experience for the young child. While feeding, the infant should experience the pleasant sensations of warmth, softness, and satisfaction. The seeing child will soon associate looking at her/his mother and her smile with the expected food; the blind baby learns to listen for her/his mother's steps and her voice. It is very important that early impressions in connection with feeding are made pleasant because they often influence later eating habits (Lowenfeld, 1971).

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